CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Canceled)

2. (Canceled)

3. (Currently amended) A microfluidic optical switch comprising:
a fluid contained in a reservoir having a characteristic;
a first optical waveguide having an end located proximate said fluid;
at least one second optical waveguide having an end located proximate said fluid; and
an actuator coupled to said fluid for changing the characteristic of the fluid, wherein said characteristic is a deformable interface formed on said fluid, wherein said deformable interface is a ~~position~~ surface of a meniscus that controllably ~~directs~~ reflects a light beam from said first optical waveguide to the at least one second optical waveguide.

4. (Canceled)

5. (Original) The optical switch of claim 3, wherein said actuator controls the shape of the deformable interface.

6. (Currently amended) A microfluidic optical switch comprising:
a fluid contained in a reservoir having ~~a characteristic~~ a polarization layer of charge;
a first optical waveguide having an end located proximate said fluid;

at least one second optical waveguide having an end located proximate said fluid; and

an actuator coupled to said fluid for changing ~~the characteristic~~ the polarization layer of charge of the fluid, wherein changes in the polarization layer of charge alters ~~said characteristic is~~ a controllable refractive index gradient that controllably directs a light beam from said first optical waveguide to the at least one second optical waveguide.

7. (Currently amended) A microfluidic optical switch comprising:

a fluid contained in a reservoir having a ~~characteristic~~ polarization layer of charge;

a first optical waveguide having an end located proximate said fluid;

at least one second optical waveguide having an end located proximate said fluid; and

an actuator coupled to said fluid for changing the ~~characteristic~~ polarization layer of charge of the fluid, wherein said fluid further comprises a controllable refractive index gradient region that is controlled by an electric signal that changes the polarization layer of charge to direct a light beam from said first optical waveguide to the at least one second optical waveguide.

8. (Previously presented) A microfluidic optical switch comprising:

a fluid contained in a reservoir having a characteristic;

a first optical waveguide having an end located proximate said fluid;

at least one second optical waveguide having an end located proximate said fluid; and

an actuator coupled to said fluid for changing the characteristic of the fluid, wherein said fluid further comprises a controllable refractive index gradient region that is controlled by an incident light to direct a light beam from said first optical waveguide to the at least one second optical waveguide.

9. (Previously presented) The optical switch of claim 6, wherein said reservoir is a tubule.

10. (Canceled)

11. (Currently amended) A method for operating a microfluidic optical switch comprising:

supplying light through a first waveguide to be incident upon a fluid;

altering a characteristic of the fluid; and

~~directing~~ reflecting, in response to the characteristic alteration, the light into a second waveguide, wherein said characteristic is a surface position of a meniscus.

12. (Currently amended) A method for operating a microfluidic optical switch comprising:

supplying light through a first waveguide to be incident upon a fluid;

altering a ~~characteristic~~ polarization layer of charge of the fluid; and

directing, in response to the ~~characteristic~~ alteration of the polarization layer of charge, the light into a second waveguide~~, wherein said characteristic is a refractive index gradient~~.

13. (Currently amended) The method of claim 12, further comprising:

controlling said ~~controllable refractive index gradient~~ polarization layer of charge using an electric signal.

14. (Currently amended) The method of claim 12, further comprising:

controlling said ~~controllable refractive index gradient~~ polarization layer of charge using an incident light.

15. (Currently amended) The method of claim 12, wherein said altering step further comprises:

activating an actuator to alter the ~~characteristic~~ polarization layer of charge.

16. (Currently amended) A method for operating a microfluidic optical switch comprising:

supplying light through a first waveguide to be incident upon a surface of a meniscus of a fluid;

altering a ~~characteristic of the fluid~~ position of the meniscus surface; and

~~directing~~ reflecting, in response to the ~~characteristic~~ alteration of the surface position, the light into a second waveguide, wherein said altering step further comprises:

activating an actuator to alter the ~~characteristic~~ surface position, wherein said actuator is an electrohydrodynamic actuator.

17. (Previously presented) The method of claim 12, wherein said directing step further comprises:

directing said light into one of a plurality of waveguides.

18. (Cancel)

19. (Cancel)